

requested. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attachment is captioned "Version With Markings To Show Changes Made."

Rejection In View Of Priegnitz

Claims 15-23 have been rejected under section 103 as being unpatentable over U.S. Patent No. 6,162,267 to Priegnitz et al. U.S. Patent No. 6,162,267 was filed on Dec. 11, 1998.

The Attached to this Amendment is a 131 Declaration (actually there are two identical 131 Declarations, one is signed by Dr. Yong Wang and the other signed by Drs. Tonkovich and VanderWiel). As established by the facts set forth in the attached 131 Declaration, applicants possessed the claimed invention on or before the effective date of the cited reference (Priegnitz). Alternatively, the attached 131 Declaration shows as much of the claimed invention as is shown in the cited reference (Priegnitz) and therefore the Priegnitz reference is eliminated as prior art. See MPEP 715.02 citing *In re Stryker* 168 USPQ 372 (CCPA 1971) and *In re Wakefield*, 164 USPQ 636 (CCPA 1970). More specifically, the evidence in the 131 Declaration shows reduction to practice of: a steam reforming catalyst structure comprising a spinel support and a steam reforming catalyst (Rh or Ni). The catalyst structure was subsequently tested and found to possess the properties recited in claim 15 and described in the Example.

Thus, the 131 Declaration establishes that applicants possessed the claimed invention on or before Dec. 11, 1998 (or, alternatively, on or before Dec. 11, 1998, applicants possessed at least as much of the claimed invention as the Priegnitz reference). Accordingly, the Priegnitz reference has

been eliminated as prior art, and, withdrawal of the rejection in view of Priegnitz is respectfully requested.

Additionally, Priegnitz does not teach or suggest some of the claimed features (nor are they inherent). For example, Priegnitz does not teach or suggest a catalyst structure having a magnesia passivation layer as recited in claim 20, nor a catalyst made by impregnating with magnesia as recited in claim 19 (such as by impregnating an alumina support with a solution of magnesium nitrate). Thus, the claimed invention is additionally patentable based on this ground.

#### Conclusion

If the Examiner has any questions or would like to speak to Applicants' representative, the Examiner is encouraged to call Applicants' attorney at the number provided below.

Respectfully submitted,

Date: 11 Feb. 2003

By: Frank S. Rosenberg

send correspondence to:  
Frank S. Rosenberg  
18 Echo Hill Lane  
Moraga, CA 94556  
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Frank S. Rosenberg  
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

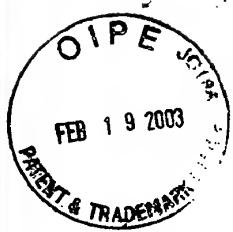
The paragraph beginning at page 1, line 9, after "RELATED APPLICATIONS", has been replaced with:

-- This is a divisional of U.S. Patent Application Ser. No. 09/375,615, now U.S. Patent No. [\_\_\_\_\_] ,] 6,284,217, filed August 17, 1999. --

IN THE CLAIMS

Claim 15 has been amended as follows:

15. (Amended) A steam reforming catalyst structure comprising:  
a support comprising a spinel support; and  
a steam reforming catalyst selected from the group consisting of rhodium, iridium, nickel, palladium, platinum, carbide of group [IVb] VIb and combinations thereof;  
wherein the catalyst structure has stability such that, when tested in a packed bed at 900°C, with a feedstream consisting essentially of methane and steam at a 1:1 ratio of methane to steam, at a constant pressure and a contact time such that there is a hydrocarbon conversion of at least 50%, and measuring the CO selectivity, wherein between 26 hours time-on-stream and about 40 hours time-on-stream, the CO selectivity remains essentially unchanged and the hydrocarbon absolute conversion changes less than about 5%.



18  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Wang et al.

Application No. 09/930,040

Art Unit: 1764

Filed: Aug. 14, 2001

Examiner: B. Yildirim

For: METHOD AND CATALYST  
STRUCTURE FOR STEAM  
REFORMING OF A  
HYDROCARBON

Atty Docket: B-1482-DIV

RECEIVED  
FEB 25 2004  
TC 1700 MAIL ROOM

DECLARATION PURSUANT TO 37 CFR § 1.131

1. The attached document in which the first line reads "POx/SR" is a copy of a lab notebook page that was written on or before 11 December 1998. The entry "Yong: Ni or Rh (oxide) on

MgO/Al<sub>2</sub>O<sub>3</sub> (spinel)" is a note from a meeting showing that, on or before 11 December 1998, Yong Wang suggested preparing a steam reforming catalyst comprising Ni or Rh (oxide) on a MgO/Al<sub>2</sub>O<sub>3</sub> spinel support.

2. The attached document in which the first line begins "Precoat of" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11

December 1998, a MgO/Al<sub>2</sub>O<sub>3</sub> spinel support was made by impregnating alumina with a magnesium nitrate solution.

3. The attached document in which the first line begins "Rhodium onto" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11 December 1998, we prepared a rhodium oxide on MgO/Al<sub>2</sub>O<sub>3</sub> spinel catalyst structure. The support referred to on this page is the MgO/Al<sub>2</sub>O<sub>3</sub> spinel support described in paragraph 2 above.

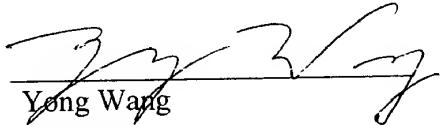
4. Subsequent testing of the catalyst described in paragraph 3 demonstrated the time-on-stream performance shown in Fig. 2 of the patent application.

5. The attached document in which the first line begins "NiO of" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11 December 1998, we prepared a nickel oxide on MgO/Al<sub>2</sub>O<sub>3</sub> spinel catalyst structure. The support referred to on this page is the MgO/Al<sub>2</sub>O<sub>3</sub> spinel support described in paragraph 2 above.

6. All of the attached documents have been copied without change except that dates have been blanked out.

7. I declare that all of the above statements made of my own knowledge are true and all statements made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. §1001), and may jeopardize the validity of the application or any patent issuing thereon.

Date: 2/15/2003

By:   
Yong Wang

Date: \_\_\_\_\_

By: \_\_\_\_\_  
David P. VanderWiel

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Anna Lee Y. Tonkovich

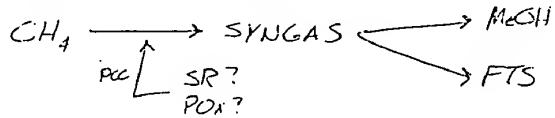
- POX/SR (...CONT'D)

- " O<sub>2</sub> conv. ~ 100% → LIMITS CH<sub>4</sub> conv.
- " SIGNIFICANT H<sub>2</sub>O FORMATION (H<sub>2</sub> SELECTIVITY ??)
- NEXT STEP: ALKALI PROMOTION
- LEE: POX MAYBE OFF THE TABLE' SOON → FOCUS ON SR
- " CAN ADD MORE O<sub>2</sub> TO INCR. SELECTIVITY, BUT conv. WILL DECR.  
→ CO<sub>2</sub> FAVORED AT HIGHER  $\frac{O_2}{CH_4}$
- YONG: Ni or Rh (oxide) on MgO/Al<sub>2</sub>O<sub>3</sub> (spinel)
- SR: (mid-low Rh loadings done) Rh/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub> -  $\frac{3}{1} = \frac{H_2O}{CH_4}$  @ 25 msec  
" <sup>higher</sup> loading performs better (2.8% Rh)
- " both have very low conv. < 25% - Select. < 70%
- "  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> RESULTS FROM EARLIER: PERF. MUCH BETTER (~100% conv.) (Select.)  
@ 15 msec. → 25 msec. → 7% Rh. (1)

- WAYNE - CAT. PREP.

- 5% Co, Fe, Ru /  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> FOR MDS READY TOMORROW
- NEED SUPPORTS - YONG: Strem, Aldrich? - ~~giant~~ ~~large~~ ~~small~~ ~~medium~~ ~~size~~?
- ERIC: FOAMS FOR YUFEI ARE READY - CERAMIC ADHESION TECHNIQUES
- SINGLE POX/SR REACTIONS: ADAPT. TO USE SAME 1/2" ANNULAR TUB  
- check sizing / flow options

- CAT. SELECTION



- SR

- " literature: precious metals - Rh best
- supports - all - Al<sub>2</sub>O<sub>3</sub> & ZnO<sub>2</sub> & MgO best
- promoters - alkali oxides

- MeOH

- " thermo: low T, high P
- " system: low P, high cat. activity (even lower T)
- " commercial: Cu-Zn/Al<sub>2</sub>O<sub>3</sub> (ICI - Catalox) } 30 atm  
- @ 120 msec: 2.5 g MeOH/g.cat.h (100% selectivity) }
- " literature: Rh, Pd - ~~selective~~ but not as activity

Project No. \_\_\_\_\_ Date of Work \_\_\_\_\_

Entered By DVW Date \_\_\_\_\_

Disclosed To and Understood By D. J. Daubert

Signed 1. D. J. Daubert Date \_\_\_\_\_

2. M. L. R. M. M. T. Date \_\_\_\_\_

Precoat of ~~Stream A~~ 93-b  $\gamma$ - $\text{Al}_2\text{O}_3$  with  $\text{MgO}$  at 6 % wt  
 from July 24, 1997 Paper by Choudhary, Upadhye, Mamman  
 from paper: Mg % reported as %  $\text{MgO}$ .

99-007

<u>Crucible</u>	<u>Wt</u>	<u><math>\gamma</math>-<math>\text{Al}_2\text{O}_3</math> wt</u>	<u>Out of Oven @ 900°C</u>
49.1663	51.1702 g	2.0039 g	51.2980

$$\text{MgO} \approx 0.1278 \text{ g}$$

$$(94) \text{ total wt} = 2.0039 \text{ g}$$

$$\text{total wt} = 2.1318 \text{ g}$$

want 0.1279 g of  $\text{MgO}$  using  $\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  Must not contain O<sub>2</sub> from Ammonium

$$\frac{\text{MgO}}{\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}} = \frac{40.3}{256.4} = \frac{0.1279 \text{ g}}{\text{Mg Nitrate}} \Rightarrow 0.8137 \text{ g}$$

$$\text{For incip. wetness: } 2.00 \text{ g} \times \frac{2.3 \text{ ml}}{3} \approx 4.6 \text{ ml sdH}$$

→ Used 0.8158 g Mg Nitrate and 4.63 ml water added (easily went into solution)

Into oven and used same temp program to: Seg 5 Seg 6  
 Ramp to 900° at 3.0°/min Dwell 120 min

6.0 %  $\text{MgO}$  Loading  
 1.88 g of -70 +100 mesh pre coated support  
 $(\approx 0.25 \text{ g} < 100 \text{ mesh})$

Check for incipient wetness with water using -100 ml

$\approx 0.52 \text{ ml}$  for -236 g of support  $\approx (2.20 \text{ ml/g})$

Project No.

Entered By

Disclosed To and Understood By

Date of Work

Date

Rhodium onto  $MgO$  Precoated  $\gamma-Al_2O_3$   
 13% as  $RhO_2$  (for Methane to Syngas) 11

13699-011

Dish Wt. cat. support

Precoated Support from pg 7

37.0331g 37.6992g

$\Rightarrow$  0.6661 g of 6% MgO pre-coated  
Support

$$(87) \text{ total wt} = 0.6661 \text{ g}$$

$$\text{total wt} = 0.7656 \text{ g} \Rightarrow 0.0995 \text{ g RhO}_2$$

$$\frac{R_h O_2}{134.9} = \frac{R_h}{R_h O_2} = \frac{x}{.09955} = \frac{102.9}{134.9} \Rightarrow .0759 \text{ g R}_h \text{ needed}$$

Using Engelhardt's 10.37% Rh solution:

10,37%  $s_{dn} = .0759$  g Rh

$$Sol'n = .7321g$$

$$0.7376 \text{ g soln} + \text{Water} = 1.3755$$

Calcined at 500° for 180 min (pg 9 program)

Out of oven: 37.8060  $\Rightarrow$  0.1068 g RhO<sub>2</sub> with 0.7729 g

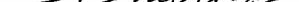
0.1068 g / 0.7729 g RhO<sub>2</sub> Catalyst

$$= 13.82\% \\ \text{RhO}_2$$

Project No. 12345678 Date of Work 12/15/2023

Entered By J. W. Cox Date 1/10/04

Disclosed To and Understood By:

Signed 1 

Date \_\_\_\_\_

2. \_\_\_\_\_ Date \_\_\_\_\_

8

$\text{NiO}$  13% onto  $\text{MgO}$  Precoated  $\gamma\text{-Al}_2\text{O}_3$   
 (Methane to Syn Gas)  
 Using support made on previous page:

13699-008

<u>Dish</u> <u>wt</u>	<u>Dish &amp;</u> <u>Cat. Support</u>	<u>37.7403</u>	<u>38.3980</u>	0.6577 <sub>g</sub> of precoated support
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$$(87.0\%) \text{ total wt} = 0.6577\text{g}$$

$$\text{total wt} = 0.7560\text{g} \Rightarrow 0.0983\text{g NiO wanted}$$

$$\frac{\text{NiO}}{\text{Ni}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}} = \frac{74.71}{290.81} = \frac{0.0983}{\text{Ni}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}} \Rightarrow 0.3826\text{g} \text{Ni}(\text{NO}_3)_2 \cdot \text{H}_2\text{O} \text{ needed}$$

$$2.20 \frac{\text{ml}}{\text{g}} \times 0.6577\text{g} = 1.45 \text{ml}$$

Used  $\Rightarrow 0.3862\text{g}$  in 1.44 ml  $\text{H}_2\text{O}$

Thurs. Out of oven,  $500^\circ$ : 38.4889<sub>g</sub>  $\Rightarrow 0.0909\text{g NiO}$

$$\frac{0.0909 \text{ NiO}}{0.7486 \text{g total}} = 12.14\% \text{ NiO}$$

- Paper lists %'s in oxides

Project No. \_\_\_\_\_ Date of Work \_\_\_\_\_

Entered By W. Wilcox Date \_\_\_\_\_

Disclosed To and Understood By

Signed 1. D. K. Wilcox Date \_\_\_\_\_

2. B. J. Wilcox Date \_\_\_\_\_



FEB 19 2003 10:04

VELOCYC INC

6147333301 P.01

PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Wang et al. :  
Application No. 09/930,040 : Art Unit: 1764  
Filed: Aug. 14, 2001 : Examiner: B. Yildirim  
For: METHOD AND CATALYST : Atty Docket: B-1482-DIV  
STRUCTURE FOR STEAM :  
REFORMING OF A :  
HYDROCARBON :  
:

DECLARATION PURSUANT TO 37 CFR § 1.131

1. The attached document in which the first line reads "POx/SR" is a copy of a lab notebook page that was written on or before 11 December 1998. The entry "Yong: Ni or Rh (oxide) on MgO/Al<sub>2</sub>O<sub>3</sub> (spinel)" is a note from a meeting showing that, on or before 11 December 1998, Yong Wang suggested preparing a steam reforming catalyst comprising Ni or Rh (oxide) on a MgO/Al<sub>2</sub>O<sub>3</sub> spinel support.
2. The attached document in which the first line begins "Precoat of" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11

December 1998, a MgO/Al<sub>2</sub>O<sub>3</sub> spinel support was made by impregnating alumina with a magnesium nitrate solution.

3. The attached document in which the first line begins "Rhodium onto" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11 December 1998, we prepared a rhodium oxide on MgO/Al<sub>2</sub>O<sub>3</sub> spinel catalyst structure. The support referred to on this page is the MgO/Al<sub>2</sub>O<sub>3</sub> spinel support described in paragraph 2 above.

4. Subsequent testing of the catalyst described in paragraph 3 demonstrated the time-on-stream performance shown in Fig. 2 of the patent application.

5. The attached document in which the first line begins "NiO of" is a copy of a lab notebook page that was written on or before 11 December 1998. This page shows that, on or before 11 December 1998, we prepared a nickel oxide on MgO/Al<sub>2</sub>O<sub>3</sub> spinel catalyst structure. The support referred to on this page is the MgO/Al<sub>2</sub>O<sub>3</sub> spinel support described in paragraph 2 above.

6. All of the attached documents have been copied without change except that dates have been blanked out.

7. I declare that all of the above statements made of my own knowledge are true and all statements made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. §1001), and may jeopardize the validity of the application or any patent issuing thereon.

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Yong Wang

Date: Feb. 11, 2003

By:   
David P. VanderWiel

Date: Feb. 10, 2003

By:   
Anna Lee Y. Tonkovich

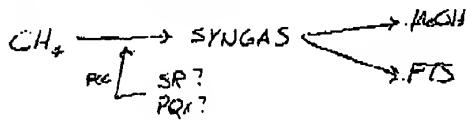
• POX/SR (...CONT'D)

- " O<sub>2</sub> conv. ~100%  $\rightarrow$  LIMITS CH<sub>4</sub> conv.
- " significant H<sub>2</sub>O formation (H<sub>2</sub> selectivity ??)
- NEXT STEP: ALKALI PROMOTION
- LEE: POX MAYBE OFF THE TABLE' SOON  $\rightarrow$  FOCUS ON SR & compressor costs
- " CAN ADD MORE O<sub>2</sub> TO INCR. SELECTIVITY, BUT CONV. WILL DECR.
- CO<sub>2</sub> FAVORED AT HIGHER  $\frac{O_2}{CH_4}$
- YOUNG: Ni or Rh (oxide) on MgO/Al<sub>2</sub>O<sub>3</sub> (spinel)
- SR: (mid-low Rh loadings done) Rh/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> -  $\frac{3}{7} \cdot \frac{16.9}{27} \approx 25$  mol %
- " <sup>higher</sup> loading performs better (2.8% Rh).
- " both have very low conv. < 25% - Select. < 80%
- $\gamma$ -Al<sub>2</sub>O<sub>3</sub> RESULTS FROM EARLIER: PERF. MUCH BETTER (~100% conv.) (Select.  $\approx 15$  mol %, 25 mol %, 7% Rh (H<sub>2</sub>)

• WAYNE - CAT. PREP.

- 5% Co, Fe, Ru /  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> FOR MDS READY TOMORROW
- NEED SUPPORTS - YOUNG: Stem, Aldrich? - ~~color, thermal, mechanical~~
- ETC: FORMS FOR YOUT ARE READY - CERAMIC ADHESION TECHNIQUES
- SIMILAR POX/SR REACTIONS: ADAPT. TO USE SAME 1/4" ANNULAR TUB
- check sizing / flow options

• CAT. SELECTION



- SR

- " literature: precious metals - Rh best
- supports - all - Al<sub>2</sub>O<sub>3</sub> & ZrO<sub>2</sub> & MgO best
- promoters - alkali oxides

- MeOH

- " thermo: low T, high P
- " system: low P, high cat. activity (even lower T)
- " commercial: Cu-Zn/Al<sub>2</sub>O<sub>3</sub> (ICI - Catiteco) } 30 atm
- @ 120 atm: 2.5 g MeOH/g cat. hr (~100% selectivity)
- " literature: Rh, Pt - selective but not as activity

Project No. \_\_\_\_\_

Date: \_\_\_\_\_

Entered By: DVW Date: \_\_\_\_\_

Disclosed To and Understood By: \_\_\_\_\_

Signed: D. Rosenburg Date: \_\_\_\_\_

FEB-11-2003 10:05

VELOCITY INC

6147333301

P.05

Feb 10 22 10:16a

frank rosenberg

925-3-8429

p.3

Precoat of <sup>1393-6</sup> ~~Stearic~~  $\text{Al}_2\text{O}_3$  with  $\text{MgO}$  at 6% wt 7  
 from July 24, 1997 Paper by Choudhury, Updegraff, Mannam  
 from paper:  $\text{MgO}$  % reported as %  $\text{MgO}$

99-007

Crucible wt	$\text{Al}_2\text{O}_3$	$\text{Al}_2\text{O}_3$ wt	<u>Out of Oven at 900°C</u>
49.1663	51.1702 g	2.0039 g	51.2980

$$\text{MgO} \Delta = 0.1278 \text{ g}$$

$$(94) \text{ total wt} = 2.0039 \text{ g}$$

$$\text{total wt} = 2.1318 \text{ g}$$

want 0.1279 g of  $\text{MgO}$  using  $\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  <sup>Must not contain any aluminum</sup>

$$\frac{\text{MgO}}{\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}} = \frac{40.3}{256.4} = \frac{0.1279 \text{ g}}{\text{Mg Nitrate}} \Rightarrow 0.8158 \text{ g}$$

For incip. wetness:  $2.00 \text{ g} \times \frac{2.3 \text{ ml}}{9} \Rightarrow 4.6 \text{ ml}$  soln

→ Used 0.8158 g  $\text{Mg Nitrate}$  and 4.63 ml water added  
 (easily went into solution)

Into oven and used same temp program to: Seg 5 Seg 6  
 Ramp to 900° Dwell  
 at 3.0°/min 120 min

6.0%  $\text{MgO}$  Loading  
 1.58 g of ~70 + 100 mesh pre-coated support  
 ( $\approx 0.35 \text{ g} \text{ <100 mesh}$ )

Check for incipient wetness with water using -100 ml  
 $\approx 0.52 \text{ g} \text{ for } 2.36 \text{ g}$  of support  $\Rightarrow (2.20 \text{ ml/g})$

Project No.

Date of Work

Entered By

Date

J. T. Tolay

FEB-11-2003 10:05

VELOCY INC

6147333301

P.06

Feb 10 22 10:17a frank rosenberg

02/10/03 10:51 FAX 5098765106

ENSL IPS

925-3-8429

p.4

0001

Rhodium onto  $MgO$  Precoated  $\gamma-Al_2O_3$   
 15%  $RhO_2$  (for Methane to Syn Gas) <sup>11</sup>

13699-011

Dish wt. catalyst support

Precoated Support from pg 7

37.0331g 37.6992g  $\Rightarrow 0.6661g$  of 6%  $MgO$  precoated Support

(89) total wt = 0.6661g  
 total wt = 0.7656g  $\Rightarrow 0.0995g RhO_2$

$\frac{RhO_2}{134.9} = \frac{Rh}{RhO_2} = \frac{x}{.0995} = \frac{102.9}{134.9} \Rightarrow .0759g Rh$  needed

Using Engelhard's 10.37% Rh solution:

10.37% soln = .0759g Rh

soln = .7321g

0.7376g soln + water = 1.3755

Calculated at 500° for 180 min (pg 7 pg 9)

Out of oven: 37.8060  $\Rightarrow 0.1068g RhO_2$  with 0.7729g <sup>Total</sup>0.1068g/0.7729g  $RhO_2$  Catalyst= 13.82%  $RhO_2$ 

Project No. \_\_\_\_\_ Date of Work \_\_\_\_\_

Entered By: J. H. Hickey Date: \_\_\_\_\_

Disclosed To and Understood By \_\_\_\_\_

Signed 1: J. H. Hickey Date: \_\_\_\_\_

2: \_\_\_\_\_

FEB-11-2003 10:05

VELOCYS INC

6147333301 P.07

Feb 10 22 10:17a

frank rosenberg

925-3-8429

P.5

02/10/03 10:51 FAX 5093765108

ENSL IPS

002

8

NiO of 13.3 onto MgO Precoated  $\gamma$ -Al<sub>2</sub>O<sub>3</sub>  
 (Methane to Syn Gas)  
 Using support made on previous page:

13699-008

Dish	Dish & wt	0.6577g of precoated support
<u>wt</u>	<u>wt</u>	
37.7403	38.3980	

$$\frac{(87.0\%)}{\text{total}} = 0.6577g \\ \text{total} = 0.7560g \Rightarrow 0.0983g \text{ NiO wanted}$$

$$\frac{\text{NiO}}{\text{Ni(O}2\text{)} \cdot \text{H}_2\text{O}} = \frac{24.71}{290.81} = \frac{0.0983}{\text{Ni(O}2\text{)} \cdot \text{H}_2\text{O}} \Rightarrow 0.3826g \text{ Ni(O}2\text{)} \cdot \text{H}_2\text{O needed} \\ 2.20 \frac{\text{g}}{\text{ml}} \times 0.6577g = 1.45 \text{ ml}$$

Used  $\Rightarrow$  0.3862 g in 1.44 ml H<sub>2</sub>O

Out of oven, 500°: 38.4889g.  $\Rightarrow$  0.909g NiO

$$\frac{0.909 \text{ NiO}}{0.7486g \text{ total}} = 12.14\% \text{ NiO}$$

— Paper lists 7% in oxides.

Project No. W. Wilcox Date of Work \_\_\_\_\_  
 Entered By \_\_\_\_\_ Date \_\_\_\_\_

Disclosed To and Understood By \_\_\_\_\_

Signed 1. D. Wilcox Date \_\_\_\_\_

2. J. Wilcox Date \_\_\_\_\_